SEASONAL HISTORY OF THE MOUNTAIN-PINE BEETLE (*DENDROCTONUS MONTICOLAE* HOPK.) IN WESTERN WHITE PINE

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SEASONAL HISTORY

In the early spring before insect activity begins, three distinct overwintering brood stages of the mountain-pine beetle are to be found in the white pine region of northern Idaho and eastern Washington. A survey of 275 infested trees in the Sullivan Creek drainage of the Kaniksu National Forest showed that 24.4 per cent contained small larvae and overwintering parent adults (Group I), 25.1 per cent contained new adult beetles (Group II), and 50.5 per cent contained mostly mature larvae (Group III). The first attacks begin early in June and continue throughout the month. These are made by the combined efforts of the overwintering parent adults from the trees in Group I and the overwintering new adults from Group II. The brood from these June attacks develops normally and is mostly in the callow adult stage by the first of September. These beetles continue to feed in the trees throughout the warm days of fall; a few emerge, but the majority overwinter and emerge to attack in June of the following year. This is the brood found as new adults in the spring.

The main emergence begins near the middle of July and continues to the middle of August. This exodus comes from the trees in Group III; i.e., those containing mature larvae which have now developed into new adults; also the new adults which attacked in June are now emerging to attack again and generate their second and last brood. The parent adults which assisted them to make the June attacks do not emerge because they perpetrated their second and last attacks by going into the June trees. The broods generated by this main attack develop fairly rapidly and are more or less mature larvae at the close of the season, overwinter in this stage, and emerge in late July and early August of the following year.

This is the brood found as mature larvae in the spring of the year.

The final attack period in reality is the tapering off of the main attack, but the attacks are made so late that the broods thus generated winter over as small larvae. This attack begins in the middle of August and continues to the end of the active season which is usually late in September. These attacks are made by the brood from the trees in Group I which in the spring contained small larvae that have now matured into new adults. The attacks at this time are also augmented by the parent beetles from the main attacks of July and early August which are now emerging (excepting those having already made their second attacks) and making their second attacks. This brood overwinters as small larvae and emerges during August and September of the following year. The parent adults in this group not having made their second attacks, overwinter and emerge in June of the following year to attack again.

Regarding this seasonal history, two things must be remembered. First, that no tree contains a "pure line"; that is, no tree contains brood propagated entirely by new adults, or entirely by parent adults making their second attacks. Instead, inasmuch as parent adults are attacking simultaneously with new adults during all three attack periods, they attack the trees together and may be found in varying percentages in the different trees. Secondly, it must be remembered that although the sequence of events will remain the same, climate will exert a very pronounced influence on brood development and thus may change the dates of the events if the yearly climatic variations are sufficiently pronounced.

CHART OF SEASONAL HISTORY

Legend

Cross hatched beetles	- New adults, which are beetles that have not yet made their first attack.
Black beetles	- Parent adults, which are beetles that have made their initial attack.
Black lines	- Extending from tree bases, represent periods over which attacks are made.

SEASONAL HISTORY OF DENDROCTONUS MONTICOLAE HOPKINS

in Western white pine. Showing attack periods – beetles causing attacks – and brood developement